STATE OF CALIFORNIA—THE RESOURCES AGENCY GRAY DAVIS, *Governor*

CALIFORNIA ENERGY COMMISSION
ROBERT A. LAURIE
COMMISSIONER

July 6, 2001

Dr. Jane Summerson
EIS Document Manager, M/S 010
U.S. Department of Energy
Office of Civilian Radioactive Waste Management
Yucca Mountain Site Characterization Office
P.O. Box 30307
North Las Vegas, Nevada 89036-0307

Re: Review of the Supplement to the Draft Environmental Impact Statement (SDEIS) and the Yucca Mountain Science and Engineering Report (S&ER) for the Proposed Yucca Mt. Radioactive Waste Repository, Nevada

Dear Dr. Summerson:

Enclosed are comments from the California Water Resources Control Board on the Supplement to the Draft Environmental Impact Statement (EIS) for Yucca Mountain. If you have any questions regarding these comments, please phone Barbara Byron at 916-654-4976.

Sincerely,

ROBERT A. LAURIE
Commissioner and State Liaison Officer
to the Nuclear Regulatory Commission

Enclosure

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State Water Resources Control Board

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Gray Davis
Governor

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website at www.swrcb.ca.gov.

TO: Commissioner Robert A. Laurie
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512

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FROM: Barbara Evoy, Chief
DIVISION OF CLEAN WATER PROGRAMS

DATE:

SUBJECT: REVIEW OF THE SUPPLEMENT TO THE DRAFT ENVIRONMENTAL IMPACT STATEMENT (SDEIS) AND THE YUCCA MOUNTAIN SCIENCE AND ENGINEERING REPORT (S&ER) FOR THE PROPOSED YUCCA MOUNTAIN RADIOACTIVE WASTE REPOSITORY, NEVADA

We appreciate the opportunity to review the May 2001 Supplement to the Draft Environmental Impact Statement (SDEIS) and Science and Engineering Report (S&ER) for the proposed Yucca Mountain Radioactive Waste Repository in Nevada. We reviewed both documents, with a focus primarily on the following chapters of the S&ER: Chapter 1.4.2 (Geology), Chapter 2.5 (Post-closure Monitoring) and Chapter 4 (Discussion of Data Relating to the Post-closure Safety of the Site). These chapters provide information regarding the hydrogeologic conditions of the site and potential environmental impact to the site and areas down-gradient of the site, specifically Amargosa and Death Valleys. Due to time constraints, our review of the document was limited in scope and may not have included all information regarding results of the scientific investigation pertinent to the Total System Performance Assessment (TSPA). In summary, the S&ER and any additional data from ongoing testing and investigation should be an integral part of the final Environmental Impact Statement (EIS). Additionally, the final EIS should better characterize the regional hydrogeology of the area, especially the relationship between the volcanic and carbonate aquifers.

Supplement to the Draft Environmental Impact Statement

The proposed flexible approach to thermal load, forced ventilation, improved waste package design and drip shields, waste mixing and aging, and especially the Performance Confirmation Program appear to be a significant improvement as compared to prior versions of the DEIS and will likely provide better protection of ground water resources. The SDEIS does not, however, address our previous comments regarding the need for further characterization of the site hydrogeologic conditions, especially the volcanic-carbonate aquifer relationship and the elevated water table/perched water in the northern portion of the Yucca Mountain site.

The S&ER summarizes the results of recent investigations conducted to evaluate the suitability of the Yucca Mountain site for a high-level radioactive waste repository. The comments presented below focus on the site hydrogeologic conditions and proposed groundwater monitoring, and expand on previous comments submitted by the State Water Resources Control Board (SWRCB) on the Yucca Mountain DEIS.

Hydrogeologic Conditions

1 Although the S&ER provides detailed hydrogeologic information on the Yucca Mountain site, specific data on the hydrogeology of down-gradient areas is lacking. The final EIS should include any pertinent hydrogeologic information obtained from the Nye County Early Warning Drilling Program.

More specifically, the hydrogeologic characterization of the carbonate aquifer in the vicinity of the Yucca Mountain repository is insufficient. The characterization, based on data from a single well, is not sufficient to provide a reliable interpretation of basic hydrogeologic parameters such as hydraulic conductivity and ground water flow direction. Further, it is recommended that additional monitoring wells be installed in the carbonate aquifer to further assess the hydraulic conditions within this aquifer, as well as to examine the hydraulic gradient between the volcanic and carbonate aquifers. Additional data would significantly improve the present hydrogeologic model and its ability to predict potential plume migration. The current computer models attempt to predict the fate and transport of radionuclides 10,000 years into the future. However, without an accurate representation of the present hydrogeologic parameters of the aquifer, it is difficult to judge the model's reliability.

Ground Water Monitoring

2... The S&ER addresses monitoring of the unsaturated and saturated zones for potential migration of radionuclides from the repository. One monitoring well located up-gradient, and four monitoring wells located down-gradient from the site are proposed. The final EIS should be amended to include a more detailed description of the proposed ground water monitoring plan and the rationale behind the monitoring system design.

Any potential radionuclide release would likely affect the perched water aquifer prior to deeper aquifers. Additionally, the perched water aquifer may be an important factor influencing the hydraulic gradient within the volcanic aquifer and subsequently any potential plume migration. Therefore, the final monitoring system design should be based on an improved hydrogeologic model, including an improved characterization of the perched water and volcanic/carbonate aquifers as well as any pertinent information obtained during the repository construction and performance confirmation program.

The proposed monitoring of the unsaturated zone, repository drifts and nuclear waste containment units is comprised of observation drifts and alcoves, equipped with monitoring instruments placed either in the emplacement drifts and/or in boreholes. The proposed monitoring appears to be adequate for this stage of the investigation. However, the final unsaturated zone monitoring plan design should be based on the thermal load operating mode

2 cont and results of the ongoing thermal drift-scale and seepage tests. In addition, the final EIS should include a detailed description of the proposed monitoring device(s).

Hot Thermal Load vs. Low Thermal Load

3 The S&ER proposes a flexible design thermal operating mode, which considers both low and high temperature modes and allows water flow between emplacement drifts. The higher temperature mode will require more extensive and prolonged forced ventilation. It appears that the proposed "higher temperature operating mode" would be more protective of ground water resources than the proposed "lower temperature operating mode". Thermal changes of the surrounding rocks will likely be minimal at a slightly higher temperature and would also likely be limited to the area in closest proximity to the repository. The benefits of isolating the radioactive materials from ground water resources would greatly exceed any potential benefits of keeping the surrounding rocks at a lower temperature. The "higher temperature operating mode" would also retard any potential migration of ground water into the repository. In contrast, the "lower temperature mode" appears to be more uncertain and more labor extensive and has the potential to cause more environmental disturbances. Additionally, by increasing the area of the repository, there is an increased chance of encountering fault(s) and/or fractures. The higher temperatures may decrease the potential for any microbial corrosion. Improved waste containment material and drip shields may also provide better protection from corrosion. The final decision regarding the thermal operating mode should be based on drift-scale thermal test results and the results of long-term corrosion testing of the drip shield and waste containment materials to be used in the final design.

Again, thank you for the opportunity to review the SDEIS and S&ER for the proposed Yucca Mountain Radioactive Waste Repository. If you have any questions regarding these comments, please contact Jan Stepek at (916) 341-5777 or via email at stepekj@cwp.swrcb.ca.gov.

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